E76-10498

CR-148753

EFFECTS OF CONSTRUCTION AND STAGED FILLING OF RESERVOIRS ON THE ENVIRONMENT AND ECOLOGY

Dr. R. K. Jain, Principal Investigator
U.S. Army Construction Engineering Research Laboratory (USACERL)
P.O. Box 4005
Champaign, Illinois 61820

Date: 21 October 1976
Type II Progress Report for Period
1 July 1976 - 30 September 1976

Prepared for:

Goddard Space Flight Center (GSFC)
Greenbelt, Maryland 20771

TYPE II PROGRESS REPORT
For the Period 1 July 1976 - 30 September 1976

TITLE: Effects of Construction and Staged Filling of Reservoirs on the Environment and Ecology, Investigation Number 23500

PRINCIPAL INVESTIGATOR: Dr. Ravinder K. Jain
U.S. Army CERL
P.O. Box 4005
Champaign, IL 61820

GSFC IF NUMBER: 350

A. PROBLEMS: None

B. ACCOMPLISHMENTS: LANDSAT imagery for the April to May time period has been processed and coded. The optical processing system has been evaluated for repeatability and accuracy. The results are shown in the attached tables.

Repeatability tests are shown in Table 1. Set I indicates variances of 8% to 25% among five interpreters interpreting tonal characteristics for the same scene at scale 1:250,000. A single interpreter interpreting the same scene at two different times differed in interpretation of tonal characteristics by 4% when viewing at scale 1:250,000 (Set II) and by 2% when viewing at scale 1:62,500 (Set III).

Accuracy tests using six different scenes indicated the following:

1. For summer and fall months, forest cover is represented by a single tone. For spring months, forest cover is best represented by two tones.

2. When using the tone representations described in part 1, the area of interpreted forest cover corresponds to the area of ground truth forest cover within 86% to 98% depending on the date of the imagery (Table 2).

3. Comparisons on a cell-by-cell basis indicate that interpreted forest cover is mistaken about 30% to 40% of the time and that ground truth forest cover is missed around 23% to 60% of the time (Tables 3 and 4).

It is concluded that gridded tonal interpretations using LANDSAT imagery is not sufficiently accurate to provide baseline data upon which environmental monitoring can be based.

Land-use and forest-cover maps were prepared using high-altitude aircraft imagery. Maps were prepared at scales 1:62,500 and 1:130,000. It appears that photointerpretation using this imagery will provide adequate baseline for environmental monitoring of land features.

C. SIGNIFICANT RESULTS: None

D. PUBLICATIONS: None

E. RECOMMENDATIONS: None

F. AIRCRAFT DATA: No additional underflight since last report.

		% of Tone Mistaken	% of GT Correctly ID	% of Area Not ID
I.	1	45	41	26
	2	42	51	13
	3	39	43	31
	4	39	48	21
	5	44	35	38
II.	1	42	51	13
	2	42	48	17
III.	1	40	65	9
	2	33	62	7

Results of Repeatability Tests Using Five Interpreters and the Same Scene, and Using the Same Interpreter and Same Scene at two Different Times.

Sets I, II Scale = 1:250,000
Set III Scale = 1:62,500

Table 1.

	% of Area Not ID			
	Mapped GT		Imagery GT	
Scene	Tone 1	Tone 1 & 2	Tone 1	Tone 1 & 2
Aug 73	+ 2	+29	+ 2	+29
Nov 73	- 7	+12	- 7	+12
Mar 75	-23	+ 4	-23	+ 4
Apr 74	-39	+ 9	--	+10
May 75	-38	+14	-38	+14
Jul 76	- 7	+22	- 7	+21

Results of Accuracy Tests at Scale 1:62,500
Compared by Area to Mapped and Imagery GT

Table 2.

Scene	% of Tone Mistaken		% of GT Correctly ID	
	Tone 1	Tone 1 & 2	Tone 1	Tone 1 & 2
Aug 73	56	50	45	56
Nov 73	55	56	42	50
Mar 75	43	43	44	59
Apr 74	--	55	--	49
May 75	51	54	30	53
Jul 76	53	55	44	54

Results of Accuracy Tests at Scale 1:62,500
Compared Cell-by-Cell to Imagery GT

Table 3.

Scene	% of Tone Mistaken		% of GT Correctly ID	
	Tone 1	Tone 1 & 2	Tone 1	Tone 1 & 2
Aug 73	34	36	67	83
Nov 73	33	34	62	74
Mar 75	32	35	52	68
Apr 74	39	35	37	70
May 75	31	34	43	75
Jul 76	32	34	63	80

Results of Accuracy Tests at Scale 1:62,500
Compared Cell-to-Cell to Mapped GT

Table 4.